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ican Government, who had taken great pains to obtain correct information on the subject, and represented the average wages in the different counties of the state; but if wages are higher in Chihuahua than stated, it will only strengthen the substance of my article.

In confirmation of the data contained in the article I will quote from the list of current prices of Mexican products which appears in the *Official Journal* of the Federal Government of Mexico, of December 15, 1891, the price of a *fanega* of corn, equivalent to about two bushels, in different parts of that country:

At Tepic (Territory of Tepic)......	$1.87	At Allende (Chihuahua).......... ..	$1.50
At Guadalajara (Jalisco) . $2.25 to	2.50	At Alamos (Sonora)..................	6.50
At Cuatxingo (Mexico)..............	3.50	At Culiacan (Sinaloa)................	11.00

This remarkable difference in prices is noticed on some other grains and produce, such as beans, chickpeas, wheat, and barley, and is due to the different conditions of each locality, and especially to the abundance or scarcity of rain, which naturally affects the crops, and also to the difficulty of communication and the consequent high freights. Prices would find their level if grain could, for instance, be carried profitably from the places where it is abundant to those where the crops have failed or been poor. This state of affairs, however, shows the great chances which Mexico offers to business men.

M. Romero.

FLYING-MACHINES.

"Does the leetle, chatterin', sassy wren,
No bigger'n my thumb, know more than men?"—Trowbridge.

There is nothing to prevent man from flying, like the eagle of the Alps or the condor of the Andes, except his want of inventive skill; and if the signs be true, this will not very much longer prevent the desired consummation. Nature has not given man wings; neither has she given him fins, yet he outstrips the strongest of the finny tribes in traversing the deep; she has not given him weapons, yet he vanquishes the fiercest warriors of the forest and jungle; she does not protect him from cold or heat, yet he is neighbor both to the polar bear and the tropical elephant.

There is no miracle in the swallow's arrowy flight; it only applies the well-known laws of dynamics. Darius Green's logic was good so far as it went. The trouble was not that

"The bluebird and phœbe
Are smarter'n we be,"

or that

"the bat
Had got more brains than's in his hat,"

but that his brains did not work long and hard enough over the problem of flying.

Man may equal and even surpass the swallow in speed, but he can never possess the swallow's perfect command of his movements in the air, to curvet and turn at sharp angles like a ray of light from opposing mirrors. Three physical laws preclude such a possibility.

First—The time required for the production, change in direction, or overcoming of motion, is inversely as the mass moved.

Second—The relative strength of a body, whether to resist or to exert force, diminishes with its magnitude.

Third—The relative sustaining effect of moving air upon a body diminishes with the magnitude of the body.

The smallest material thing in existence is the ultimate atom. This has infinite strength—*i. e.*, it is capable of resisting an infinite stress, and is therefore capable of receiving and imparting, unchanged itself, any force brought to bear upon it. The next smallest thing is the molecule, which no power less than chemical affinity can disintegrate. A single pair of molecules, held together by the maximum power of cohesion, is the next strongest thing in existence. As the number of cohering molecules increases, the more easily does the mass yield to a disintegrating force. Thus, the little wooden bridge which will sustain a hundred times its weight without bending perceptibly, if enlarged indefinitely will fall apart of its own weight, and the child's paper boat, which rides triumphantly on the miniature lake in a basin, if increased in all its dimensions would collapse in a shapeless mass. The only way in which we can conceive of Gulliver's Brobdingnags as possible is by supposing that the size of the atoms of which they were composed was great in proportion to their bodies. Under like conditions only could the roc of the "Arabian Nights" sail the air like the eagle of reality.

But even then the gigantic bird would have a harder task to perform than the eagle, just as the eagle has a harder task than the swallow, unless the aërial atoms themselves were enlarged, and their sustaining power, when in motion as wind, were thereby increased in the same proportion.

For these reasons, then, man will never poise himself in the air like the dragon-fly, nor zigzag through it like the swallow. Nevertheless, there appears to be no adequate reason why he should not, some fine Fourth of July, astonish

"the nation
An' all creation
By flyin' over the celebration,"

if he can only devise a motor, with the necessary accessories, which will not add too much to his own weight. But even great additional weight will not be an insurmountable obstacle, provided a sufficiently rapid motion can be attained.

It takes time for the greatest power to move the smallest mass; that is to say, if a force were applied for only an instant (*i. e.*, a point of time) to a mass, it would not move it in that instant. If, then, a great weight should press for only an instant against a small resistance—as that of the air—it would for that instant be sustained. Hence it is only necessary for the weight to move fast enough horizontally to rest for only an instant upon any given mass of air, in order to be sustained. As it moved from mass to mass it would not have time to fall through any one of them. Of course this condition can be reached only approximately; but the closer the approximation, the less uplifting power would be required in the motor.

The principle is strikingly illustrated by Mr. Langley, of the Smithsonian Institution, by comparing such a mass to a skater moving rapidly over thin ice. The briefest pause or diminution in his speed, and his support would instantly yield; but it is only necessary for him to move fast enough to glide over a film as thin as tissue paper.

Here, then, is the problem of aërial navigation theoretically solved. Given, a mass of any size or weight, spread laterally so as to rest upon a sufficiently large mass of air, and moving with sufficient speed horizontally, and your flying-machine, so long dreamed of and so ardently sought, is achieved!

Such is, or is to be, Professor Langley's *Aëroplane*, the realization of the magic carpet of the "Arabian Nights." May Fortune and his happy genius bring speedy success!

JULIEN ST. BOTOLPHE.